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charged, or placed in an smelting furnace including, but not limited to, calibration of weighing equipment and other measurement devices. The estimated accuracy of measurements made with these devices must also be recorded, and the technical basis for these estimates must be provided.

§ 98.188 Definitions.

All terms used in this subpart have the same meaning given in the Clean Air Act and subpart A of this part.

Subpart S—Lime Manufacturing

§ 98.190 Definition of the source category.

(a) Lime manufacturing plants (LMPs) engage in the manufacture of a lime product (e.g., calcium oxide, high-calcium quicklime, calcium hydroxide, hydrated lime, dolomitic quicklime, dolomitic hydrate, or other lime products) by calcination of limestone, dolomite, shells or other calcareous substances as defined in 40 CFR 63.7081(a)(1).

(b) This source category includes all LMPs unless the LMP is located at a kraft pulp mill, soda pulp mill, sulfite pulp mill, or only processes sludge containing calcium carbonate from water softening processes. The lime manufacturing source category consists of marketed and non-marketed lime manufacturing facilities.

(c) Lime kilns at pulp and paper manufacturing facilities must report emissions under subpart AA of this part (Pulp and Paper Manufacturing).

[74 FR 56374, Oct. 30, 2009, as amended at 75 FR 66464, Oct. 28, 2010]

§ 98.191 Reporting threshold.

You must report GHG emissions under this subpart if your facility is a lime manufacturing plant as defined in § 98.190 and the facility meets the requirements of either § 98.2(a)(1) or (a)(2).

§ 98.192 GHGs to report.

You must report:

(a) CO₂ process emissions from lime kilns.

(b) CO₂ emissions from fuel combustion at lime kilns.

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(c) N₂O and CH₄ emissions from fuel combustion at each lime kiln. You must report these emissions under 40 CFR part 98, subpart C (General Stationary Fuel Combustion Sources).

(d) CO₂, N₂O, and CH₄ emissions from each stationary fuel combustion unit other than lime kilns. You must report these emissions under 40 CFR part 98, subpart C (General Stationary Fuel Combustion Sources).

(e) CO₂ collected and transferred off site under 40 CFR part 98, following the requirements of subpart PP of this part (Suppliers of Carbon Dioxide (CO₂)).

§ 98.193 Calculating GHG emissions.

You must calculate and report the annual process CO₂ emissions from all lime kilns combined using the procedure in paragraphs (a) and (b) of this section.

(a) If all lime kilns meet the conditions specified in § 98.33(b)(4)(ii) or (b)(4)(iii), you must calculate and report under this subpart the combined process and combustion CO₂ emissions by operating and maintaining a CEMS to measure CO₂ emissions according to the Tier 4 Calculation Methodology specified in § 98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(b) If CEMS are not required to be used to determine CO₂ emissions from all lime kilns under paragraph (a) of this section, then you must calculate and report the process and combustion CO₂ emissions from the lime kilns by using the procedures in either paragraph (b)(1) or (b)(2) of this section.

(1) Calculate and report under this subpart the combined process and combustion CO₂ emissions by operating and maintaining a CEMS to measure CO₂ emissions from all lime kilns according to the Tier 4 Calculation Methodology specified in § 98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(2) Calculate and report process and combustion CO₂ emissions separately using the procedures specified in paragraphs (b)(2)(i) through (b)(2)(v) of this section.

(i) You must calculate a monthly emission factor for each type of lime

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produced using Equation S-1 of this section. Calcium oxide and magnesium oxide content must be analyzed month-

ly for each lime product type that is produced:

$$EF_{LIME,i,n} = \left[(SR_{CaO} * CaO_{i,n}) + (SR_{MgO} * MgO_{i,n}) \right] * \frac{2000}{2205} \quad (\text{Eq. S-1})$$

Where:

$EF_{LIME,i,n}$ = Emission factor for lime type i, for month n (metric tons CO₂/ton lime).

SR_{CaO} = Stoichiometric ratio of CO₂ and CaO for calcium carbonate [see Table S-1 of this subpart] (metric tons CO₂/metric tons CaO).

SR_{MgO} = Stoichiometric ratio of CO₂ and MgO for magnesium carbonate (See Table S-1 of this subpart) (metric tons CO₂/metric tons MgO).

$CaO_{i,n}$ = Calcium oxide content for lime type i, for month n, determined according to

§ 98.194(c) (metric tons CaO/metric ton lime).

$MgO_{i,n}$ = Magnesium oxide content for lime type i, for month n, determined according to § 98.194(c) (metric tons MgO/metric ton lime).

2000/2205 = Conversion factor for tons to metric tons.

(ii) You must calculate a monthly emission factor for each type of calcined byproduct/waste sold (including lime kiln dust) using Equation S-2 of this section:

$$EF_{LKD,i,n} = \left[(SR_{CaO} * CaO_{LKD,i,n}) + (SR_{MgO} * MgO_{LKD,i,n}) \right] * \frac{2000}{2205} \quad (\text{Eq. S-2})$$

Where:

$EF_{LKD,i,n}$ = Emission factor for calcined lime byproduct/waste type i sold, for month n (metric tons CO₂/ton lime byproduct).

SR_{CaO} = Stoichiometric ratio of CO₂ and CaO for calcium carbonate (see Table S-1 of this subpart) (metric tons CO₂/metric tons CaO).

SR_{MgO} = Stoichiometric ratio of CO₂ and MgO for magnesium carbonate (See Table S-1 of this subpart) (metric tons CO₂/metric tons MgO).

$CaO_{LKD,i,n}$ = Calcium oxide content for calcined lime byproduct/waste type i sold,

for month n (metric tons CaO/metric ton lime).

$MgO_{LKD,i,n}$ = Magnesium oxide content for calcined lime byproduct/waste type i sold, for month n (metric tons MgO/metric ton lime).

2000/2205 = Conversion factor for tons to metric tons.

(iii) You must calculate the annual CO₂ emissions from each type of calcined byproduct/waste that is not sold (including lime kiln dust and scrubber sludge) using Equation S-3 of this section:

$$E_{waste,i} = \left[(SR_{CaO} * CaO_{waste,i}) + (SR_{MgO} * MgO_{waste,i}) \right] * M_{waste,i} * \frac{2000}{2205} \quad (\text{Eq. S-3})$$

Where:

$E_{waste,i}$ = Annual CO₂ emissions for calcined lime byproduct/waste type i that is not sold (metric tons CO₂).

SR_{CaO} = Stoichiometric ratio of CO₂ and CaO for calcium carbonate (see Table S-1 of this subpart) (metric tons CO₂/metric tons CaO).

SR_{MgO} = Stoichiometric ratio of CO₂ and MgO for magnesium carbonate (See Table S-1 of this subpart) (metric tons CO₂/metric tons MgO).

$CaO_{waste,i}$ = Calcium oxide content for calcined lime byproduct/waste type i that is not sold (metric tons CaO/metric ton lime).

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MgO_{waste,i} = Magnesium oxide content for calcined lime byproduct/waste type i that is not sold (metric tons MgO/metric ton lime).

M_{waste,i} = Annual weight or mass of calcined byproducts/wastes for lime type i that is not sold (tons).

2000/2205 = Conversion factor for tons to metric tons.

(iv) You must calculate annual CO₂ process emissions for all kilns using Equation S-4 of this section:

$$E_{CO_2} = \sum_{i=1}^t \sum_{n=1}^{12} (EF_{LIME,i,n} * M_{LIME,i,n}) + \sum_{i=1}^b \sum_{n=1}^{12} EF_{LKD,i,n} * M_{LKD,i,n} + \sum_{i=1}^z E_{waste,i} \quad (\text{Eq. S-4})$$

Where:

E_{CO₂} = Annual CO₂ process emissions from lime production from all kilns (metric tons/year).

EF_{LIME,i,n} = Emission factor for lime type i produced, in calendar month n (metric tons CO₂/ton lime) from Equation S-1 of this section.

M_{LIME,i,n} = Weight or mass of lime type i produced in calendar month n (tons).

EF_{LKD,i,n} = Emission factor of calcined byproducts/wastes sold for lime type i in calendar month n, (metric tons CO₂/ton byproduct/waste) from Equation S-2 of this section.

M_{LKD,i,n} = Monthly weight or mass of calcined byproducts/waste sold (such as lime kiln dust, LKD) for lime type i in calendar month n (tons).

E_{waste,i} = Annual CO₂ emissions for calcined lime byproduct/waste type i that is not sold (metric tons CO₂) from Equation S-3 of this section.

t = Number of lime types produced

b = Number of calcined byproducts/wastes that are sold

z = Number of calcined byproducts/wastes that are not sold

(v) Calculate and report under subpart C of this part (General Stationary Fuel Combustion Sources) the combustion CO₂ emissions from each lime kiln according to the applicable requirements in subpart C.

[74 FR 56374, Oct. 30, 2009, as amended at 75 FR 66464, Oct. 28, 2010]

§ 98.194 Monitoring and QA/QC requirements.

(a)(a) You must determine the total quantity of each type of lime product that is produced and each calcined byproduct/waste (such as lime kiln dust) that is sold. The quantities of each should be directly measured monthly with the same plant instruments used for accounting purposes, including but

not limited to, calibrated weigh feeders, rail or truck scales, and barge measurements. The direct measurements of each lime product shall be reconciled annually with the difference in the beginning of and end of year inventories for these products, when measurements represent lime sold.

(b) You must determine the annual quantity of each calcined byproduct/waste generated that is not sold by either direct measurement using the same instruments identified in paragraph (a) of this section or by using a calcined byproduct/waste generation rate.

(c) You must determine the chemical composition (percent total CaO and percent total MgO) of each type of lime product that is produced and each type of calcined byproduct/waste sold according to paragraph (c)(1) or (2) of this section. You must determine the chemical composition of each type of lime product that is produced and each type of calcined byproduct/waste sold on a monthly basis. You must determine the chemical composition for each type of calcined byproduct/waste that is not sold on an annual basis.

(1) ASTM C25-06 Standard Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime (incorporated by reference—see § 98.7).

(2) The National Lime Association's CO₂ Emissions Calculation Protocol for the Lime Industry English Units Version, February 5, 2008 Revision-National Lime Association (incorporated by reference—see § 98.7).

(d) You must use the analysis of calcium oxide and magnesium oxide content of each lime product that is produced and that is collected during the